

# Dr. Andrei P. Igoshev

## Curriculum Vitae

Address: Technion - Israel Institute of Technology, Haifa, 3200002, Israel

Tel.: +972 55 9797876

e-mails: [ignotur@gmail.com](mailto:ignotur@gmail.com) [ignotur@physics.technion.ac.il](mailto:ignotur@physics.technion.ac.il)

web-site: <http://www.pulsars.info/about.html>

Nationality: Russian

---

### EDUCATION

**Doctor of Philosophy** in Astronomy, defended on 21st December 2017

Thesis topic: “Neutron stars as fragmentary records of supernova explosions”

Radboud University Nijmegen | Nijmegen, the Netherlands

Department of Astrophysics

Research supervisor: Prof. Frank Verbunt

**Specialist Diploma of Higher Education with Distinction** in Astronomy, completed in July 2012

Diploma topic: “Population synthesis of Galactic neutron stars: magnetic fields and luminosity models.”

Saint Petersburg State University | Saint Petersburg, Russia

Department of Astrophysics

Research supervisors: Prof. Alexander F. Kholtgyn, Prof. Sergei B. Popov

### EMPLOYMENT

**Post-doctoral fellow**, Technion - Israel Institute of Technology, Israel

December 2017 - current, working with Prof. Hagai Perets

Study of binary and triple stellar evolution using the Gaia data, analysis of X-ray data, astrostatistics

**PhD candidate**, Department of Astrophysics/IMAPP, Radboud University, the Netherlands

October 2013 - October 2017

Study of observed properties of radio pulsars using the Bayesian and maximum likelihood analysis with C++ and Python.

**Research engineer**, laboratory of theoretical astrophysics, Saint Petersburg State University, Russia

January 2011 - September 2013

Development of the code for population synthesis of isolated radio pulsars using C++

### HONORS and AWARDS

**Rappe Promotie Premie**, Institute for Mathematics, Astrophysics and Particle Physics, Radboud University Nijmegen

February 2018

**NOVA PhD funding**, Netherlands Research School for Astronomy

(Nederlandse Onderzoekschool voor de Astronomie), October 2013 – September 2017

**Best Diploma Thesis**, Saint Petersburg State University

June 2012

**Leonardo Euler Scholarship**, Saint Petersburg State University

February 2008 - January 2009

**PROFESSIONAL MEMBERSHIP and CONTRIBUTIONS** **Journal Reviewer for MNRAS (2018)**  
**Member of the Advisory Board in Astronomy & Astrophysics** at the Cambridge Scholars Publishing (2017 – current)  
**Member of the Dutch astronomical society (NAC)**

## RESEARCH EXPERIENCE

**Scientific Interest** Neutron stars, statistical methods in astronomy, magnetic fields, pulsars, magnetars, CCO, population synthesis method, initial parameters of neutron stars, binary stellar evolution

**Research Expertise** Statistical methods (Bayesian, maximum likelihood,  $\chi^2$ , Kolmogorov-Smirnov, moments of distributions, Monte Carlo simulations), population synthesis, galactic dynamics, crust of NS, Gaussian mixture model, numerical methods (integration with step control, partial differential equations, regularisation)

**Proposals** Obs. ID 0804240201 “Revealing the nature of three pulsars with large spin down age in a vicinity of OB associations.”  
**PI: Igoshev**, 60 ks at the XMM-Newton.

## TEACHING EXPERIENCE

**Teaching Assistant**, Radboud Universiteit Nijmegen  
February 2014 - January 2015  
Master level: “Cosmic magnetism”  
Bachelor level “Introduction to the General Relativity”, “Programming in Python”  
January 2015 - June 2015  
Master level: “Binary stars”  
Bachelor level “Introduction to the General Relativity”  
September 2015 - June 2016  
Master level: “Cosmic magnetism”  
Bachelor level “Programming in Python”

## ORGANIZATION EXPERIENCE

**Member of LOC**, Dutch Astronomical Conference, responsible for website, database, communication with participants and poster prize  
September 2016 - May 2017  
**Journal club**, Radboud Universiteit Nijmegen, responsible for organization  
April 2016 - May 2017, biweekly meeting with master, PhD students and post-docs.  
**Member of LOC**, Astronomical olympiad for school students of the Netherlands, responsible for the website  
February 2015 - June 2016

## SKILLS

**Languages** **English** - fluent, **Russian** - native, **German** - B1, **Dutch** - B2

**Computing** Comfortable with Python, C++, C, Fortran, GSL, Gnuplot, Bash shell scripts, HTML, Linux, Latex

Familiar with ADQL, CSS, PHP, SQL, OpenMP, Javascript

**Personality** Punctual, responsible, creative

## PUBLICATIONS

- Refereed** I have published 15 articles which earned 140 citations, h-index 7 according to NASA ADS.
- First author**
- A.P. Igoshev** “Ages of radio pulsar: long-term magnetic field evolution” accepted to MNRAS on 29 October 2018, in press
  - A.P. Igoshev**, S. Tsygankov, M. Rigoselli, S. Mereghetti, S. Popov, J. Elfritz, & A. Mushtukov “Discovery of X-rays from the old and faint pulsar J1154–6250” ApJ 2018, 865, 2, 116
  - A.P. Igoshev**, & S.B. Popov “How to make a mature accreting magnetar” MNRAS 2018, 473, 3, 3204-3210
  - A.P. Igoshev**, J.G. Elfritz, S.B. Popov “Post fall-back evolution of multipolar magnetic fields and radio pulsar activation” MNRAS 2016, 462, 4, 3689
  - A.P. Igoshev**, F. Verbunt, E. Cator “Distance and luminosity probability distributions derived from parallax and flux with their measurement errors. With application to the millisecond pulsar PSR J0218+4232” A&A 2016, 591, 10
  - A.P. Igoshev** & S.B. Popov “Magnetic field decay in normal radio pulsars” AN 2015, 336, 8-9, 831
  - A.P. Igoshev** & S.B. Popov “Modified pulsar current analysis: probing magnetic field evolution” MNRAS 2014, 444, 1066
  - A.P. Igoshev** & S.B. Popov “Gaussian mixture model and population synthesis of radio pulsars” MNRAS 2013, 434, 2229
  - A.P. Igoshev** & S.B. Popov “Neutron star’s initial spin period distribution” MNRAS 2013, 432, 967
  - A.P. Igoshev**, S.B. Popov & R. Turolla “Unifying neutron stars: getting to GUNS” AN 2014, 335, 3, 262
  - A.P. Igoshev** & A.F. Kholtygin “Statistics of magnetic fields and fluxes of massive OB stars and the origin of neutron star magnetic fields” AN 2011, 332, 1012
- Other**
- S. Toonen, H.B. Perets, **A.P. Igoshev**, E. Michaely & Y. Zenati “The demographics of neutron star - white dwarf mergers: rates, delay-time distributions and progenitors” A&A 2018, 619, 13
  - F. Verbunt, **A.P. Igoshev**, E. Cator “The observed velocity distribution of young pulsars” A&A 2017, 608, 15
  - S. Repetto, **A.P. Igoshev**, G. Nelemans “The Galactic distribution of X-ray binaries and its implications for compact object formation and natal kicks” MNRAS 2017, 467, 1, 298-310
  - D.J. Jones, **A.P. Igoshev**, M. Haverkorn “A new method to probe the thermal electron content of the Galaxy through spectral analysis of background sources” MNRAS 2016, 460, 3, 3298-3304
- Submitted**
- A.P. Igoshev**, H.B. Perets & S. Toonen “The observed velocities of millisecond radio pulsars” submitted to A&A on 16 October 2018
- Non-refereed**
- A.P. Igoshev** & S.B. Popov “Is PSR J0250+5854 at the Hall attractor stage?”, 2018, RNAAS, 2, 3, 171
  - S.B. Popov, **A.P. Igoshev**, R. Taverna & R. Turolla “Looking for Hall attractor in astrophysical sources”, 2017, JPhCS, 932, 1
  - A.P. Igoshev** & A.F. Kholtygin “Population synthesis of young neutron stars” Proceedings of the International Astronomical Union, 2013, 291, 411
  - A.P. Igoshev** & A.F. Kholtygin “Neutron stars: history of the magnetic field decay” Proceedings of the International Astronomical Union, 2013, 291, 408
  - A.F. Kholtygin, S.N. Fabrika, N.A. Drake & **A.P. Igoshev** “Magnetic fluxes of massive stars: statistics and evolution” Active OB stars: structure, evolution, mass loss, and critical limits, Proceedings of the International Astronomical Union, IAU Symposium, 2011, 272, 198

## PRESENTATIONS

### Talks

- “Multipoles re-emergence and central compact objects”  
Physics of neutron stars, Saint Petersburg, Russia, 12 July 2017
- “Radio Pulsar Activation seen through a Prism of High Order Multipoles Magnetic Field Evolution”  
Formation and evolution of neutron stars, Bonn, Germany, 14 November 2016
- “Probability Distributions for Pulsar Distance and Luminosity”  
Different Flavors of MSPs and their Connections, Bonn, Germany, 30 November 2015
- “From parallax to distance: not easy”  
NW3 meeting, Utrecht, Netherlands, 5 November 2015
- “Comprehensive analysis of pulsars velocity distribution”  
International conference Physics of neutron stars, St. Petersburg, Russia, 28 July 2014
- “Analysis of magnetic field decay in pulsars”  
High energy astrophysics – today and tomorrow, Russian Space Research Institute RAS, 25 December 2013
- “Magnetic fields decay in pulsars. Population synthesis and other statistical methods”  
XMM-Newton 2013 Science Workshop, ESA, Madrid, Spain, 23 May 2013
- “Analysis of magnetic field decay in pulsars. Accurate calculations and details”  
High energy astrophysics – today and tomorrow, Russian Space Research Institute RAS, 26 December 2012
- “Spin Down Age: the key to magnetic field decay”  
Electromagnetic Radiation from Pulsars and Magnetars, in University of Zelona Gora, Poland, 26 April 2012

### Posters

- “On the Velocities that BH- and NS-XRBs Receive at Formation: Bayesian Approach”  
Binary stars, Institute of Astronomy, Cambridge, UK, 24-30 July 2016
- “Natura evanesca/elusive nature: high order multipole structure of magnetic field survives the fall back episode”  
71 Netherlands Astronomy Conference, Nunspeet, the Netherlands, 23-25 May 2016
- “Initial periods of radio pulsars and magnetic field decay”  
All Russian Astronomical Conference (VAK), Pulkovo Observatory, Saint Petersburg, 25 September 2013
- Latest results from the neutron-star laboratory, Amsterdam, The Netherlands, May 6 2013